

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

IN THE CLAIMS:

1. (Currently Amended) Hydraulic steering system (~~100~~) for a vehicle, in particular for a mobile machine, having at least two steering cylinders (~~1, 2~~), in which cylinder pistons (~~3, 4~~) are displaceable, the position and/or direction of motion of which in the steering cylinders (~~1, 2~~) fix the steering angle and/or steering direction of steerable vehicle wheels relative to a body (~~5~~) of the vehicle, wherein each of the displaceable cylinder pistons (~~3, 4~~) divides the associated steering cylinder (~~1, 2~~) into in each case two pressure chambers (~~6 and 7, 8 and 9~~), and having an, in terms of the volumetric displacement, variable first hydraulic pump (~~14~~), the first port (~~46~~) of which is connected, depending on the steering direction to one of the pressure chambers (~~6, 7~~) of the first steering cylinder (~~1~~) and to one of the pressure chambers (~~8, 9~~) of the second steering cylinder (~~2~~),

~~characterized in~~

~~that~~ wherein the second port (~~15~~) of the variable first hydraulic pump (~~14~~) is connected in a closed circuit to the other pressure chamber (~~6, 7~~) of the first steering cylinder (~~1~~) and to the other pressure chamber (~~8, 9~~) of the second steering cylinder (~~2~~).

2. (Currently Amended) Hydraulic steering system according to claim 1,

characterized in

~~that~~ wherein in each case a first pressure chamber ~~(7; 9)~~ adjoins the associated cylinder piston ~~(3; 4)~~ with a pressurization area (A1) that is smaller than the pressurization area (A2), with which the in each case other second pressure chamber ~~(6; 8)~~ adjoins the corresponding cylinder piston ~~(3; 4)~~, and that each port ~~(46; 15)~~ of the hydraulic pump ~~(14)~~ is connected to a first pressure chamber ~~(7; 9)~~ with a smaller pressurization area (A1) and to a second pressure chamber ~~(8; 6)~~ with a larger pressurization area (A2).

3. (Currently Amended) Hydraulic steering system according to claim 1 ~~or~~ 2,

characterized in

~~that~~ wherein the delivery direction of the hydraulic pump ~~(14)~~ operating in two-quadrant mode fixes the steering direction.

4. (Currently Amended) Hydraulic steering system according to claim 3,

characterized in

~~that~~ wherein the pressure medium volume delivered at the first port ~~(46)~~ and/or at the second port ~~(15)~~ of the hydraulic pump ~~(14)~~ operating in two-quadrant mode fixes the steering angle.

5. (Currently Amended) Hydraulic steering system according to claim 4,

characterized in

~~that~~ wherein setting of the swiveling direction of the hydraulic pump ~~(14)~~ and of the pressure medium volume delivered at the first port ~~(46)~~ and at the second port ~~(15)~~ of the hydraulic

pump (14) is effected in dependence upon a deflection set at a first steering organ (43) designed in the style of a steering wheel and/or at a second steering organ (44) designed in the style of a joystick.

6. (Currently Amended) Hydraulic steering system according to claim 5,

~~characterized in~~

~~that~~ wherein in dependence upon the deflection of the first and/or second steering organ (43, 44) an adjusting valve (35) is activated.

7. (Currently Amended) Hydraulic steering system according to claim 6,

~~characterized in~~

~~that~~ wherein the deflection of the adjusting valve (35) is effected by means of electric actuating solenoids at control ports (40, 41), which receive from the first and/or second steering organ (43, 44) in each case an electrical adjusting signal, which is generated by an electrical transducer (42, 64) and corresponds to the deflection of the first or second steering organ (43, 44).

8. (Currently Amended) Hydraulic steering system according to claim 7,

~~characterized in~~

~~that~~ wherein the deflection of the adjusting valve (35) is effected by means of the adjusting pressures that act in the control chambers situated at the two control ports (40, 41) and correspond to the deflection of the first or second steering organ (43, 44).

9. (Currently Amended) Hydraulic steering system according to claim 8,

characterized in

that wherein at the first and second port ~~(51, 55)~~ of a variable second hydraulic pump ~~(52)~~ adjusting pressures arise, which correspond to the deflection of the first steering organ ~~(43)~~.

10. (Currently Amended) Hydraulic steering system according to claim 8 ~~or 9~~,

characterized in

that wherein in a pilot unit ~~(54)~~ two pressure reduction valves ~~(62, 63)~~, the inputs of which are connected in each case to the high-pressure port ~~(19)~~ of a feed pump ~~(17)~~ and to a hydraulic tank ~~(61)~~, generate the adjusting pressures corresponding to the deflection of the second steering organ ~~(44)~~.

11. (Currently Amended) Hydraulic steering system according to ~~one of claims 1 to 10~~,

characterized in

that claim 1, wherein the adjusting valve ~~(35)~~ is a 4/3-way valve, wherein the first input port ~~(67)~~ thereof is connected to the high-pressure port ~~(19)~~ of a feed pump ~~(17)~~, the second input port ~~(68)~~ thereof is connected to a hydraulic tank ~~(39)~~, the first output port ~~(65)~~ thereof is connected to a first adjusting pressure chamber ~~(32)~~ of a variation device ~~(30)~~ and the second output port ~~(66)~~ thereof is connected to a second adjusting pressure chamber ~~(33)~~ of the variation device ~~(30)~~.

12. (Currently Amended) Hydraulic steering system according to claim 11,

~~characterized in~~

~~that~~ wherein the variation of the first hydraulic pump (14) in terms of the swiveling direction and the pressure medium volume delivered at its first port (46) and the pressure medium volume delivered at its second port (15) is effected by means of the variation device (30).

13. (Currently Amended) Hydraulic steering system according to claim 11 ~~or 12~~,

~~characterized in~~

~~that~~ wherein the first hydraulic pump (14) and the feed pump (17) are driven via a common drive shaft (16) by a mobile machine, in particular by a diesel-driven generating set.

14. (Currently Amended) Hydraulic steering system according to ~~one of claims 11 to 13~~,

~~characterized in~~

~~that~~ claim 11, wherein a low-pressure port (18) of the feed pump (17) is connected by a filter (20) to a hydraulic tank (21), and the high-pressure port (19) of the feed pump (17) is connected in each case by a non-return valve (21, 22) to a first hydraulic load line (12), which is connected to the first port (46) of the first hydraulic pump (14), and to a second hydraulic load line (13), which is connected to the second port (15) of the first hydraulic pump (14).

15. (Currently Amended) Hydraulic steering system according to claim 14,

~~characterized in~~

~~that~~ wherein in the first and second hydraulic load lines (12, 13) in each case a non-return valve (47, 48) is provided.

16. (Currently Amended) Hydraulic steering system according to ~~one of claims 1 to 15,~~

characterized in

~~that~~ claim 1, wherein with regard to their adjusting piston rods the steering cylinders (1, 2) are oriented relative to one another at an angle α of up to max. 90° .